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EXAMINER

RUDE, TIMOTHY L

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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2871

DATE MAILED: 05/31/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n N .

09/750,073

Applicant(s)

LEE ET AL.

Examiner

Timothy L Rude

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-- The MAILING DATE of this communication appears n the cover sheet with the correspondence address --
Period f r Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12 and 13 is/are allowed.
- 6) ☒ Claim(s) 1-11 and 14-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-7, 10, 14, 15, 17, 18, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Koma, USPAT 5,608,556.

As to claims 1 and 10, Koma discloses in Figures 3-7, (First embodiment, col. 5, line 21 through col. 7, line 67) a multi-domain liquid crystal display device comprising: a first substrate, 10, defined by a plurality of pixel regions; an orientation control electrode, 22, (Applicant's common auxiliary electrode) (col. 6, lines 5-8) around each pixel region on the first substrate; an orientation control window, 33a, filled with orientation film material, 34, (Applicant's dielectric structure) (col. 6, lines 28-34) (running from lower left to upper right) on a second substrate, 30, the dielectric structure being divided each pixel region into a plurality of domains (lower right domain from upper left domain); an additional structure (portion of 34 in 33a running from upper left to lower right) compensating electric field around a corner portion within each pixel region; and a liquid crystal director, 40, (Applicant's liquid crystal layer) between the first substrate and the second substrate.

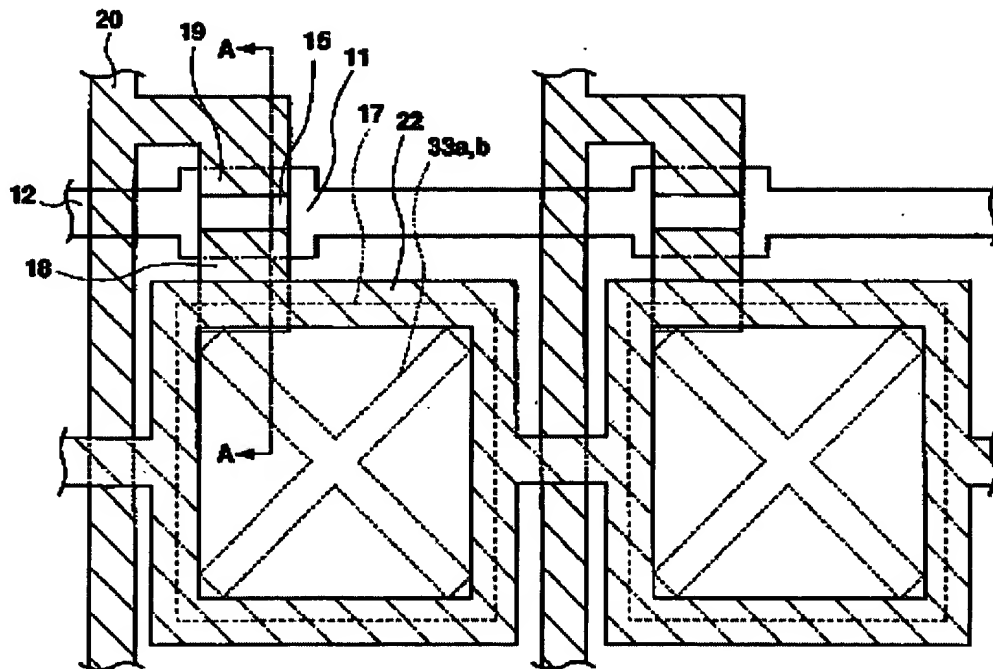


Fig. 3

As to claim 2, Koma discloses in Figures 3-7, (First embodiment, col. 5, line 21 through col. 7, line 67) the multi-domain liquid crystal display device of claim 1, further comprising: a plurality of gate lines, 12, on the first substrate in a first direction; a plurality of drain lines, 20, (Applicant's data lines) formed in a second direction to cross the first direction; thin film transistors (col. 5, lines 27-31) formed in a portion where the gate lines cross the data lines; and a display electrode, 17, (Applicant's pixel electrode) connected with the thin film transistors in the pixel region defined by the gate lines and the data lines.

As to claim 3, Koma discloses in Figures 3-7, (First embodiment, col. 5, line 21 through col. 7, line 67) the multi-domain liquid crystal display device of claim 1, further comprising an orientation film, 23 and 34, (Applicant's alignment film) on the first substrate and the second substrate, respectively.

As to claim 4, the recitation "the common auxiliary electrode is formed with the gate lines" is a process recitation. No structural limitations are present in claim 4.

The device of Koma, therefore, anticipates all relevant recitations of claim 4.

As to claim 5, Koma discloses in Figures 3-7, (First embodiment, col. 5, line 21 through col. 7, line 67) the multi-domain liquid crystal display device of claim 1, wherein the orientation control electrode, 22, (Applicant's common auxiliary electrode) is not formed with the gate electrode, 11, (Applicant's gate lines) (on different layers per Figure 4, see also col. 5, lines 42-46).

As to claim 6, Koma discloses in Figures 3-7, (First embodiment, col. 5, line 21 through col. 7, line 67) the multi-domain liquid crystal display device of claim 1, wherein liquid crystal molecules within each domain have different alignment directions (Figure 6 and col. 6 line 66 through col. 7, line 8).

As to claim 7, Koma discloses in Figures 3-7, (First embodiment, col. 5, line 21 through col. 7, line 67) the multi-domain liquid crystal display device of claim 1, wherein

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the dielectric structure includes a first orientation control window, 33a, filled with orientation film material, 34, (Applicant's dielectric structure) (col. 6, lines 28-34) (running from lower left to upper right) on a second substrate, 30, and a second and third structure regions (portions of 34 in 33a running from middle to lower right and running from middle to upper left).

As to claim 14, Koma discloses in Figures 3-7, (First embodiment, col. 5, line 21 through col. 7, line 67) a multi-domain liquid crystal display device comprising: first and second substrates, 10 and 30; a plurality of gate lines, 12, and drain lines, 20, (Applicant's data lines) on the first substrate to cross each other; orientation control electrodes (Applicant's common auxiliary electrodes) within and around each pixel region (per Figure 3) on the first substrate; an orientation control window, 33a, filled with orientation film material, 34, (Applicant's dielectric structure) (col. 6, lines 28-34) (running from lower left to upper right), and an additional structure (portion of 34 in 33a running from upper left to lower right) (Applicant's plurality of dielectric structures) on the second substrate, 30, corresponding to a region where the common auxiliary electrodes are not formed (per Figure 3); and a liquid crystal director, 40, (Applicant's liquid crystal layer) between the first substrate and the second substrate.

As to claim 15, Koma discloses in Figures 3-7, (First embodiment, col. 5, line 21 through col. 7, line 67) the multi-domain liquid crystal display device of claim 14, wherein each pixel region is divided into four domains (Applicant's at least three domains).

As to claim 17, Koma discloses in Figures 3-7, (First embodiment, col. 5, line 21 through col. 7, line 67) the multi-domain liquid crystal display device of claim 14, wherein the orientation control electrodes (Applicant's common auxiliary electrodes) have an extension portion (portion overlapping drain line, 20, in Figure 3) electrically connected with the orientation control electrodes (Applicant's common auxiliary electrodes) of a neighboring pixel region.

As to claim 18, Koma discloses in Figures 3-7, (First embodiment, col. 5, line 21 through col. 7, line 67) the multi-domain liquid crystal display device of claim 14, further comprising an orientation film, 23 and 34, (Applicant's alignment film) on the first substrate and the second substrate, respectively.

As to claim 20, Koma discloses in Figures 3-7, (First embodiment, col. 5, line 21 through col. 7, line 67) a multi-domain liquid crystal display device comprising: first and second substrates, 10 and 30; a plurality of gate lines, 12, on the first substrate in a first direction; a plurality of drain lines, 20, (Applicant's data lines) formed in a second direction to cross the first direction; a plurality of thin film transistors (col. 5, lines 29-32)

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formed in a portion where the gate lines cross the data lines; a plurality of pixel regions between neighboring gate and data lines; an orientation control electrode (Applicant's common auxiliary electrode) around and within each pixel region (per Figure 3); a plurality of display electrodes, 17, (Applicant's pixel electrodes) formed in each pixel region to connect with the thin film transistors; an orientation control window, 33a, filled with orientation film material, 34, (Applicant's dielectric structure) (col. 6, lines 28-34) (running from lower left to upper right), and an additional structure (portion of 34 in 33a running from upper left to lower right) (Applicant's plurality of dielectric structures) on the second substrate in a region where the common auxiliary electrode is not formed (per Figure 3); an orientation film, 23 and 34, (Applicant's alignment film) on the first substrate and the second substrate, respectively; and a liquid crystal director, 40, (Applicant's liquid crystal layer) between the first substrate and the second substrate.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 11, 19, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koma, as applied to claims 1 and 14 above, in view of Matsuyama et al (Matsuyama) USPAT 6,081,315.

As to claims 11, 19, and 21, Koma discloses the multi-domain liquid crystal display device of claim 1.

Koma does not explicitly disclose a phase difference film on at least one of the first and second substrates.

Matsuyama teaches the use of optical compensation films (Applicant's phase difference film) in Figure 1 (col. 5, lines 18-27) to compensate the vertical orientation mode.

Matsuyama is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add optical compensation films to compensate the vertical orientation mode of the liquid crystal layer.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Koma with the optical compensation films of Matsuyama.

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3. Claims 8, 9, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koma, as applied to claims 1 and 14 above, in view of Ohmuro et al (Ohmuro) USPAT 2001/0043,305 A1

As to claims 8 and 9, Koma discloses the multi-domain liquid crystal display device of claim 1.

Koma does not explicitly disclose a device wherein the dielectric structure includes an electric field induction window.

Ohmuro teaches the use of cavities, 62, (Applicant's field induction window) formed as holes or slits in the glass substrate (per Figures 4-6), only in regions where abnormal domains tend to occur, to suppress occurrence of disclinations [0062 and 0063].

Ohmuro is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add cavities (Applicant's field induction window) formed in the glass substrate, only in regions where abnormal domains tend to occur, to suppress occurrence of disclinations.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Koma with the cavities of Ohmuro.

As to claim 16, Koma discloses the multi-domain liquid crystal display device of claim 14.

Koma does not explicitly disclose a device wherein the dielectric structures have a zig-zag shape.

Ohmuro teaches in Figures 3-5 the use of projections, 50, of light transmitting material (Applicant's dielectric structures) in zig-zag shape to provide uniform transmittance characteristics without disclinations [0058].

Ohmuro is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add projections of light transmitting material (Applicant's dielectric structures) in zig-zag shape to provide uniform transmittance characteristics without disclinations.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Koma with the zig-zag projections of Ohmuro.

Allowable Subject Matter

4. Claims 12 and 13 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

As to claim 12 a search of relevant prior art or record did not disclose, alone or in combination, a multi-domain liquid crystal display device comprising: first and second substrates; a plurality of gate lines on the first substrate in a first direction; a plurality of

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data lines formed in a second direction to cross the first direction; a plurality of thin film transistors formed in a portion where the gate lines cross the data lines; a plurality of pixel regions between neighboring gate and data lines; a common auxiliary electrode around each pixel region; a plurality of pixel electrodes formed in each pixel region to connect with the thin film transistors; a dielectric structure on the second substrate, *the dielectric structure being applied electric field with the common auxiliary electrode and being divided the pixel region into at least four domains; at least one or more additional structures formed at an end portion of the dielectric structure within the pixel region;* an alignment film on at least one of the first substrate and the second substrate; and a liquid crystal layer between the first substrate and the second substrate.

As to claim 13, it is dependent upon claim 12 with allowable subject matter above.

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5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L Rude whose telephone number is (703) 305-0418. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William L Sikes can be reached on (703) 308-4842. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7725 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.



Timothy L Rude
Examiner
Art Unit 2871

TLR
May 28, 2002



James A Dudek
Primary Examiner
Art Unit 2871